Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (previously amended) A chamber shield assembly for a semiconductor-wafer vacuum processing apparatus comprising a plurality of shields including the upper source shield as claimed in claim **36**, wherein:

each of the plurality of shields is made of high thermal conductivity material to provide high thermal conductivity throughout each shield;

each shield has a mounting surface configured to provide intimate thermal contact with the wall of a chamber of the apparatus when secured thereto, the mounting surface having sufficient area to provide high thermal conductivity between the shield and the wall of the chamber.

2. (original) The shield assembly of claim **1** wherein:

the shields have a common axis and generally circular, annular cross sections in planes perpendicular to the axis; and

the mounting surfaces having an area that provides the intimate thermal contact that is at least as large as the area of the cross sections of the respective shields.

3. (original) The shield assembly of claim **2** wherein:

the mounting surfaces provide a thermal conductivity between the shields and the chamber wall that is at least as great as the thermal conductivity across said cross sections of the respective shields.

4. (original) The shield assembly of claim 3 wherein:

the shields are configured to mount in a cooperating relationship, when installed in the chamber, out of contact with each other and spaced oy gaps sufficient to avoid arcing; and

the gaps are dimensioned, and the mounting surfaces are located in relation to the gaps, such that the gaps remain sufficient to avoid arcing during any likely thermal expansion of the shields.

5. (original) The shield assembly of claim 1 wherein:

the shields are configured to mount in a cooperating relationship, when installed in the chamber, out of contact with each other and spaced by gaps sufficient to avoid arcing; and

the gaps are dimensioned, and the mounting surfaces are located in relation to the gaps, such that the gaps remain sufficient to avoid arcing during any likely thermal expansion of the shields.

6. (currently amended) A wafer processing apparatus comprising:

a vacuum chamber bounded by a temperature controlled chamber wall;

a chamber shield assembly according to claim 1 ~~that includes:~~

~~a plurality of shields formed of high thermal conductivity material;~~

~~each shield having a mounting surface connected in intimate thermal contact with the wall of a chamber, the mounting surface having area so as to provide high thermal conductivity between the shield and the wall of the chamber.~~

7. (original) The apparatus of claim **6** wherein:

the shields have a common axis and generally circular, annular cross sections in planes perpendicular to the axis; and

the mounting surfaces having an area that provides the intimate thermal contact that is at least as large as the area of the cross sections of the respective shields.

8. (original) The apparatus of claim **7** wherein:

the mounting surfaces provide a thermal conductivity between the shields and the chamber wall that is at least as great as the thermal conductivity across said cross sections of the respective shields.

9. (original) The apparatus of claim **8** wherein:

the shields are mounted in a cooperating relationship, out of contact with each other and spaced by gaps sufficient to avoid arcing; and

the gaps are dimensioned, and the mounting surfaces are located in relation to the gaps, such that the gaps remain sufficient to avoid arcing during any likely thermal expansion of the shields.

10. (original) The apparatus of claim **6** wherein:

the shields are mounted in a cooperating relationship, out of contact with each other and spaced by gaps sufficient to avoid arcing; and

the gaps are dimensioned, and the mounting surfaces are located in relation to the gaps, such that the gaps remain sufficient to avoid arcing during any likely thermal expansion of the shields.

11. (original) The apparatus of claim **10** further comprising:

cooperating alignment structure on the shields and on the chamber wall configured to locate the shields in the cooperating relationship when installed in the chamber.

12. (original) The apparatus of claim **6** further comprising:

an array of radiant heaters spaced around the chamber so as to enable the direction of radiant heating onto extended surfaces of a plurality of the shields of the assembly.

13. (original) The apparatus of claim **6** further comprising:

an array of radiant lamps oriented parallel to the axis of the chamber and spaced around the chamber so as to enable the direction of radiant heating onto extended surfaces of a plurality of the shields of the assembly.

Claims **14-35** (canceled)

36. (currently amended) An upper source shield configured to surround a material source and energy source in a removable top portion of a cooled and grounded chamber wall of a semiconductor processing apparatus for protecting said top portion from deposition, comprising:

an annular element comprising a top ring, a sloped ring, a bottom ring, and a mounting element, wherein:

the top ring comprises inner surface, top surface, and an outer surface;

the sloped ring comprises an inner surface coupled to the inner surface of the top ring, and an outer surface coupled to the outer surface of the top ring;

the bottom ring comprises an inner surface coupled to the inner surface of the sloped ring, an outer surface coupled to the outer surface of sloped ring, and a bottom surface coupled to the inner surface and the outer surface; and

the mounting element comprises a mating surface coupled to the outer surface of the sloped ring and configured to form intimate thermal contact and electrical contact with the removable top portion of the cooled and grounded chamber wall and to support the annular element thereon, at least one other surface ~~coupled to the top surface and the outer surface of bottom ring~~.

37. (previously amended) The upper source shield as claimed in claim **36**, wherein the annular element is fabricated from a single block of material.

38. (original) The upper source shield as claimed in claim **37**, wherein the material is aluminum (6061-T6).

39. (original) The upper source shield as claimed in claim **36**, wherein the upper source shield comprises a height of at least approximately 116.4 mm.

40. (previously amended) The upper source shield as claimed in claim **63**, wherein the mounting element comprises a number of through-holes extending from the mating surface to the bottom surface, wherein each through-hole has a diameter of at least approximately 25.4 mm.

41. (previously amended) The upper source shield as claimed in claim **40**, wherein the through-holes are located on a circle having a diameter of approximately 560 mm, and have angular displacements of approximately 40.3 degrees and approximately 90 degrees.

42. (previously amended) The upper source shield as claimed in claim **63,** wherein the mounting element comprises at least one slot extending from the mating surface to the bottom surface, wherein the slot is located on a circle having a diameter of approximately 584.7 mm and has an angular displacement of approximately 37.5 degrees.

43. (previously amended) The upper source shield as claimed in claim **42,** wherein the slot has a length of at least approximately 4 mm, and a width of at least approximately 5 mm.

44. (previously amended) The upper source shield as claimed in claim **63,** wherein the mounting element comprises at least one hole extending from the mating surface to the bottom surface, wherein the hole is located on a circle having a diameter of at least approximately 586.7 mm and has a diameter of approximately 5 mm.

45. (original) The upper source shield as claimed in claim **36**, wherein the top ring comprises an inside diameter of at least approximately 372.8 mm and an outside diameter of at least approximately 380.9 mm.

46. (original) The upper source shield as claimed in claim **36**, wherein the sloped ring comprises an angular displacement of approximately 124.5 degrees.

47. (original) The upper source shield as claimed in claim **36**, wherein the bottom ring comprises an outside diameter of approximately 567 mm and a thickness of at least approximately 6.3 mm.

48. (original) The upper source shield as claimed in claim **36**, wherein the mounting element comprises an outside diameter of at least approximately 605.0 mm and a thickness of at least approximately 6.3 mm.

49. (previously amended) The upper source shield as claimed in claim **36**, wherein the inner surface, the top surface, and at least a portion of an outer surface of top ring; the inner surface of the sloped ring ~~portion~~; and the inner surface, the outer surface, and the bottom surface of the bottom ring are grit blasted.

50. (previously amended) The upper source shield as claimed in claim **37**, wherein the inner surface of the sloped ring portion, and the inner surface, the outer surface, and the bottom surface of bottom ring are arc sprayed.

51. (previously amended) The upper source shield as claimed in claim **37**, wherein the inner surface of the sloped ring, and the inner surface, the outer surface, and the bottom surface of the bottom ring are coated using at least one of Al_2O_3, Yttria (Y_2O_3), Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

Claims **52-62** (canceled)

63. (currently amended) The upper source shield as claimed in claim **36**, wherein the at least one other surface includes a bottom surface, an outer surface coupled to the ~~top~~ mating surface and the bottom surface of the mounting element, and a lower surface coupled to the bottom surface of the mounting element and the outer surface of bottom ring.